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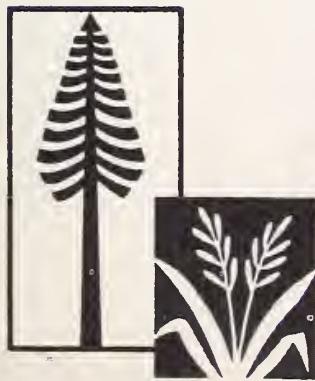
Del Norte County,
California, 1965

Daniel D. Oswald and Gerald S. Walton

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Pacific Southwest Forest and Range
Experiment Station - Berkeley, California
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An inventory of Del Norte County's timber resources was completed in 1965. Results are reported in this publication. Past Forest Survey inventories have included Del Norte County, but they were not designed to obtain volume estimates for an individual county.

This publication is the first of a series reporting inventory findings for the important timber producing counties of California's North Coast.

This inventory is part of the nationwide Forest Survey, authorized by the McSweeney-McNary Forest Research Act of 1928. The Forest Survey periodically inventories the extent and condition of the forestlands and their timber resources, to determine the resource base, rates of forest growth and use, and trends in supply of raw materials for the wood products industries. Such information is needed in formulating forest policy and programs.

The Forest Survey is conducted by the Forest Service's regional experiment stations. The Del Norte County inventory was made by the Pacific Southwest Forest and Range Experiment Station.

Highlights

Commercial Forest Land

More than three-fourths--76 percent--of Del Norte County consists of commercial forest land.¹ Of the 487,000 acres of such land, 69 percent is publicly owned, and 31 percent privately owned. Sawtimber-size stands of timber occupy 68 percent of this land. More than half--55 percent--of the commercial forest land is occupied by Douglas-fir type; redwood type takes up 15 percent. All softwood types combined account for 80 percent of the commercial forests; and hardwoods the remaining 20 percent.

Growing Stock Volume

Growing stock in the county totals 2,211,000,000 cubic feet. Of this amount, 61 percent is Douglas-fir, and 28 percent redwood. Nearly the entire volume consists of softwood species and is in sawtimber-size trees. Ownership is divided as follows: 67 percent publicly owned, and 33 percent privately owned.

Sawtimber Volume

Sawtimber-size trees total 12,836,000,000 board feet (International 1/4-inch log rule). Nearly three-fourths--70 percent--is publicly owned. And 65 percent is in trees 39.0 inches or larger (diameter breast height).

¹See appendix for definition of terms.

Comparison with Previous Inventory

Information on timber volume for Del Norte County was not compiled separately in the State-wide initial survey completed in 1952, but area statistics for the county were compiled for 1948 and published.² The 1965 inventory suggests that commercial forest land in the county has increased by 36,000 acres from the previous survey.

This increase can be attributed to several factors. The 1952 acreage estimates were based on delineation to a 40-acre minimum; the 1965 estimates are based on classification of land to a 1-acre minimum. Some stands that were classified noncommercial owing to inaccessibility are now classified as commercial forest. And some land that had been cleared for nonforest use has become stocked with forest trees.

The differences in acreage by forest type reflect changes in type definitions. Owing to these changes, the forest type acreages from the two surveys cannot be compared.

²U.S. Forest Service California Forest and Range Experiment Station Forest Survey Rel. 18, 23 pp., illus. 1953.

Tables

*Table 1.--Land area, by major classes of land,
Del Norte County, 1965*

Class of land	Area Acres
Forest:	
Commercial	486,943
Noncommercial	
Productive-- reserved	12,766
Unproductive	107,163
Total forest	606,872
Nonforest	35,048
Total, all classes	641,920

*Table 2.--Commercial forest land area, by ownership and stand-size classes,
Del Norte County, 1965*

Ownership	Total	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Nonstocked areas	Acres
						Acres
Federal:						
National Forest	333,672	257,514	29,158	38,852	8,148	
Other public	(1/)	(1/)	(1/)	(1/)	(1/)	
Private:						
Forest industry	129,670	63,574	--	59,975	6,121	
Farm and misc. private	23,601	11,424	--	6,088	6,089	
Total, all ownerships	486,943	332,512	29,158	104,915	20,358	

¹Less than 500 acres.

Table 3.--Commercial forest land area, by major forest types¹
and ownership groups, Del Norte County, 1965

Type	All ownership	Public ownership	Private ownership
	Acres		
Softwoods:			
Douglas-fir	266,010	229,246	36,764
Hemlock--sitka spruce	8,871	--	8,871
Redwood	71,075	14,739	56,336
Ponderosa pine	25,902	25,902	--
White pine (sugar pine)	5,424	5,424	--
Lodgepole pine	--	--	--
Fir--spruce	14,575	14,575	--
Hardwoods:			
	95,086	43,786	51,300
Total, all types	486,943	333,672	153,271

¹The forest types presented in this table conform with standard types as defined by Forest Survey.

Table 4.--Commercial forest land area, by yield class,
Del Norte County, 1965

Yield class (cubic feet) ¹	Total	National forest	Other public	Forest industry	Farm & misc. private
		Thousand acres			
120 or more	254,173	142,116	(2/)	94,119	17,938
85 to 120	89,720	71,298	(2/)	15,410	3,012
50 to 85	105,092	91,322	(2/)	11,119	2,651
Less than 50	37,958	28,936	(2/)	9,022	0
Total, all classes	486,943	333,672	(2/)	129,670	23,601

¹Based on potential yields in cubic feet per acre of mean annual growth at culmination of increment in fully stocked stands.

²Less than 500 acres.

Table 5.--Commercial forest land area, by stocking classes of growing-stock trees and by stand-size classes, Del Norte County, 1965

Stocking class	All stands	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Nonstocked stands
		Acres			
Well-stocked	237,799	197,309	10,583	29,907	--
Medium-stocked	128,246	74,742	3,235	50,269	--
Poorly-stocked	100,540	60,461	15,340	24,739	--
Nonstocked	20,358	--	--	--	20,358
Total, all classes	486,943	332,512	29,158	104,915	20,358

Table 6.--Commercial forest land area, by stand volume classes, Del Norte County, 1965

Stand volume per acre (board feet) ¹	Area Acres
Less than 1,500	126,092
1,500 to 2,500	18,510
2,500 to 5,000	36,935
5,000 to 7,500	35,574
7,500 to 10,000	16,663
More than 10,000	253,169
Total, all classes	486,943

¹Net volume, International 1/4-inch log rule.

Table 7.--Volume of timber on commercial forest land, by class of timber and species group, Del Norte County, 1965

Class of timber	All species	Softwoods	Hardwoods
	Million cubic feet		
Sawtimber trees	2,150	2,117	33
Poletimber trees	61	48	13
All growing-stock trees	2,211	2,165	46
Sound cull trees:			
Sawtimber-size trees	51	10	41
Poletimber-size trees	41	2	39
Total	92	12	80
Rotten cull trees:			
Sawtimber-size trees	61	42	19
Poletimber-size trees	4	--	4
Total	65	42	23
Salvable dead trees:			
Sawtimber-size trees	6	6	0
Poletimber-size trees	0	0	0
Total	6	6	0
Total, all timber	2,374	2,225	149

Table 8.--Volume of growing stock and sawtimber on commercial forest land, by ownership classes and species group, Del Norte County, 1965

GROWING STOCK			
Ownership class	All species	Softwoods	Hardwoods
<i>Million cubic feet</i>			
National Forest	1,486	1,480	6
Other public	--	--	--
Forest industry	685	652	33
Farm and misc. private	40	33	7
Total, all ownership	2,211	2,165	46
SAWTIMBER			
	<i>Million board feet</i>		
National Forest	9,014	9,002	12
Other public	--	--	--
Forest industry	3,624	3,560	64
Farm and misc. private	198	180	18
Total, all ownership	12,836	12,742	94

¹International 1/4-inch log rule.

Table 9.--Volume of growing stock and sawtimber on commercial forest land, by species, Del Norte County, 1965

Species	Growing stock	Sawtimber
	<i>Million cubic feet</i>	<i>Million board feet</i> ¹
Softwoods:		
Douglas-fir	1,345	8,556
Redwood	625	3,144
True firs	75	400
Sugar pine	55	316
Western hemlock	20	113
Western redcedar	6	37
Ponderosa and Jeffrey pine	5	24
Western white pine	5	11
Incense-cedar	5	23
Sitka spruce	4	18
Other softwoods	20	100
Total	2,165	12,742
Hardwoods:		
Red alder	9	19
Oaks	32	65
Other hardwoods	5	10
Total	46	94
Total, all species	2,211	12,836

¹International 1/4-inch log rule.

Table 10.--Volume of sawtimber on commercial forest land, by diameter class and species,
Del Norte County, 1965

Species	All classes	Diameter class (inches)					
		5.0-10.9	11.0-18.9	19.0-28.9	29.0-38.9	39.0 and larger	
<i>Million board feet¹</i>							
Softwoods:							
Douglas-fir	8,556	0	349	1,120	1,651	5,436	
Redwood	3,144	0	44	177	309	2,614	
True firs	400	0	72	198	79	51	
Sugar pine	316	0	22	63	113	118	
Western hemlock	113	0	2	22	25	64	
Other softwoods	213	0	46	50	42	75	
Total	12,742	0	535	1,630	2,219	8,358	
Hardwoods:							
Red alder	19	0	13	6	0	0	
Oaks	65	0	14	35	16	0	
Other hardwoods	10	0	6	4	0	0	
Total	94	0	33	45	16	0	
Total, all species	12,836	0	568	1,675	2,235	8,358	

¹International 1/4-inch log rule.

Table 11.--Volume of growing stock on commercial forest land, by diameter class and species,
Del Norte County, 1965

Species	All classes	Diameter class (inches)					
		5.0-10.9	11.0-18.9	19.0-28.9	29.0-38.9	39.0 and larger	
<i>Million cubic feet¹</i>							
Softwoods:							
Douglas-fir	1,345	31	94	191	252	777	
Redwood	625	2	10	40	65	508	
True firs	75	3	15	35	14	8	
Sugar pine	55	5	4	11	18	17	
Western hemlock	20	1	(1/)	4	4	11	
Other softwoods	45	6	11	10	7	11	
Total	2,165	48	134	291	360	1,332	
Hardwoods:							
Red alder	9	4	4	1	0	0	
Oaks	32	7	6	13	6	0	
Other hardwoods	5	1	3	1	0	0	
Total	46	12	13	15	6	0	
Total, all species	2,211	60	147	306	366	1,332	

¹Less than 500 thousand cubic feet.

Table 12.--Volume of salvable dead sawtimber-size trees
on commercial forest land, by species group,
Del Norte County, 1965

Species group	Volume <i>Million board feet</i> ¹
Softwoods	34
Hardwoods	0
All species	34

¹International 1/4-inch log rule.

Accuracy of Inventory Data

Estimates of forest land area and timber volume for Del Norte County were based on sampling and therefore include sampling errors.

Estimated sampling error--expressed as a percent of the total estimate at the 68-percent probability level--for forest area and timber volume is as follows:

Item:	Estimated total	Sampling error (percent)
Commercial forest land	486, 943 acres	<u>+ 2.9</u>
Growing stock volume	2, 211, 000 cu. ft.	<u>+ 8.0</u>
Sawtimber volume (Int. 1/4-inch rule)	12, 836, 000 bd. ft.	<u>+ 8.2</u>

The sampling error for any breakdown of the total area or volume estimates will be greater than those shown for the totals. Therefore, fine breakdowns have large percent sampling errors associated with them.

Errors due to reasons other than sampling--human errors--cannot be determined. Such errors have been kept to a minimum, however, by thorough training and close supervision of survey personnel and periodic checks of the work during all phases of the inventory.

Inventory Procedure

This inventory of Del Norte County combines data from the Six Rivers National Forest inventory project and the Forest Survey inventory project. The Six Rivers National Forest data were collected during the period 1961-1964. The remainder of the county, including part of the Siskiyou National Forest, was inventoried in 1964, and data compiled as of January 1, 1965. The same sampling design and field procedure were used throughout the county. No attempt was made to update the Six Rivers National Forest portion of the inventory for growth or cut.

A systematic grid of photo points was printed on aerial photos covering the entire County. Each photo point was classified by a trained photo interpreter. The points were then stratified into stand volume classes within commercial forest land, and noncommercial and nonforest land, based upon the photo classification.

A stratified random sample (with proportional allocation) was then drawn from the photo points. This sample of photo points was visited in the field. Each location visited was classified in the field as to land use and ownership. And for those locations falling on commercial forest land, a circular 2/5-acre inventory plot was established to provide information on volume, mortality, and forest type. The plots when remeasured will also yield information on growth.

Definition of Terms

Commercial forest land: Forest land which is producing or capable of producing crops of industrial wood and is not withdrawn from timber utilization. Includes accessible and inaccessible areas, and both operable and currently inoperable areas.

Commercial species: Tree species presently or prospectively suitable for industrial wood products; excludes so-called weed species.

Cull trees: Live trees that do not contain at least one merchantable sawlog, now or prospectively, because of roughness, rot, or species (see also sound cull trees and rotten cull trees).

Diameter classes: A classification of trees based on diameter of the tree outside bark, measured at breast height (4-1/2 feet above the ground). D.b.h. is the common abbreviation for "diameter at breast height."

Farmer-owned lands: Lands owned by operators of farms.

Forest industry lands: Lands owned by companies or individuals operating wood-using plants.

Forest land: Land at least 10 percent stocked by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.

Forest type: A classification of forest land based upon the predominant species in the present tree cover. Types are determined on the basis of plurality of stocking by all live trees. For poletimber size trees and larger, stocking is determined from basal area occurrence, and for trees less than 5.0 inches d. b. h. from number of trees.

Growing-stock trees: Live sawtimber trees, poletimber trees, saplings, and seedlings of commercial species that are, or can be expected to become suitable for use as industrial wood. Excludes cull trees.

Industrial wood: All commercial roundwood products, such as sawlogs and pulpwood, but excluding fuelwood and posts.

Land area: The area of dry land and land temporarily or partially covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile in width; and lakes, reservoirs and ponds less than 40 acres in area.

Logging residues: The unused portions of poletimber and sawtimber trees cut, or killed by harvesting timber, land clearing, or cultural operations.

Miscellaneous private lands: Privately owned lands other than forest industry or farmer-owned lands.

National Forest land: Federal lands which have been designated by Executive Order or statute as National Forests or purchase units, and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Net volume: Gross volume less deductions for defects, excluding cull trees:

Growing stock: Gross cubic foot volume less deductions for rot and missing sections.

Sawtimber: Gross board-foot volume less deductions for rot, sweep, crook, missing sections, and other defects that affect use for lumber.

Noncommercial forest land: Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions, and productive forest land such as State and National parks and wilderness areas withdrawn from commercial timber use through statute or administrative regulation.

Nonforest land: Land that has never supported forests and lands formerly forested but now developed for nonforest uses, such as crops, improved pasture, residential areas and city parks, improved roads and adjoining rights-of-way, powerline clearings, and certain areas of water classified by the Bureau of the Census as land (see land area). In forest areas unimproved roads, streams, canals, and nonforest strips must be more than 120 feet wide, and clearings in forest areas must be more than 1 acre in size, to qualify as nonforest land.

Nonstocked areas: Commercial forest land less than 10 percent stocked with growing-stock trees.

Poletimber stands: Stands at least 10 percent stocked with growing-stock trees, and with poletimber trees making up a plurality of this stocking.

Poletimber trees: Live trees of commercial species 5.0 to 10.9 inches in diameter at breast height, and of good form and vigor.

Productive-reserved forest land: Productive public forest land such as State and National Parks and wilderness areas withdrawn from timber utilization through statute or administrative regulation.

Rotten cull trees: Live trees of commercial species, 5.0 inches and larger in diameter at breast height, that do not contain at least one minimum sawlog, now or prospectively, and have less than 25 percent of their volume in sound wood primarily because of rot.

Sound cull trees: Live trees, 5.0 inches or larger in diameter at breast height, that do not contain at least one minimum sawlog, now or prospectively, and have less than 25 percent of their volume in usable form primarily because of roughness, poor form, or noncommercial species.

Salvable dead trees: Standing or down dead trees, 11.0 inches or more in diameter at breast height, that contain at least one merchantable sawlog and 25 percent or more of sound wood volume.

Saplings: Live trees of commercial species, 1.0 to 5.0 inches in diameter at breast height and of good form and vigor.

Sapling-seedling stands: Stands at least 10 percent stocked with growing-stock trees and with saplings or seedlings or both making up a plurality of this stocking.

Sawlog: A log meeting minimum approved log-grade specifications; or, for species for which approved log grades are lacking, a log at least 10 feet long, with a minimum d. i. b. of 10 inches, and with a net scale of at least 30 board feet.

Sawlog portion: That part of the bole of sawtimber trees between the stump and the sawlog top.

Sawtimber stands: Stands at least 10 percent stocked with growing-stock trees, and with sawtimber trees making up a plurality of this stocking.

Sawtimber trees: Live trees, 11.0 inches or larger in diameter at breast height, containing at least one minimum sawlog.

Seedlings: Established live trees of commercial species, less than 1.0 inch in diameter at breast height and of good form and vigor.

Stand-size classes: A classification of forest land based on the predominant size of timber present, that is, sawtimber, poletimber, saplings, and seedlings.

Stocking: A measure of the degree to which forest land is occupied by trees of specified classes in relation to a specified basal area standard for trees 5.0 inches d. b. h. and larger, or number of trees per acre for smaller trees; tree classes include (1) all live trees, and (2) growing stock trees.

Stocking classes:

Well-stocked stand: A stand that is 70 percent or more stocked with present or potential growing-stock trees.

Medium-stocked stand: A stand that is 40 to 69 percent stocked with present or potential growing-stock trees.

Poorly-stocked stand: A stand that is 10 to 39 percent stocked with present or potential growing-stock trees.

Nonstocked stand: An area less than 10 percent stocked with present or potential growing-stock trees.

Tree-size classes: A classification of growing-stock trees according to diameter at breast height outside bark, including sawtimber trees, pole-timber trees, saplings, and seedlings.

Unproductive forest land: Forest land incapable of yielding crops of industrial wood because of adverse site conditions.

Volume of growing stock: The cubic-foot volume of sound wood in the bole of noncull sawtimber and poletimber trees of commercial species from a 1-foot stump to a minimum 4.0-inch top outside bark or to the point where the central stem breaks into limbs.

Volume of salvable dead sawtimber-size trees: Net volume of dead sawtimber-size trees, standing or down, that are considered merchantable by regional standards.

Volume of sawtimber: Net volume of the sawlog portion of live sawtimber trees in board feet, International 1/4-inch log rule.

Yield classes: A classification of forest land based upon potential yields in cubic feet per acre of mean annual growth at culmination of increment in fully stocked stands.

Tree Species

Tree species found on the commercial forest land in Del Norte County include:

Softwoods

Redwood	<i>Sequoia sempervirens</i> (D. Don) Endl.
Douglas-fir	<i>Pseudotsuga menziesii</i> (Mirb.) Franco
Ponderosa pine	<i>Pinus ponderosa</i> Laws.
Jeffrey pine	<i>Pinus jeffreyi</i> Grev. & Balf.
Sugar pine	<i>Pinus lambertiana</i> Dougl.
Western white pine	<i>Pinus monticola</i> Dougl.
California red fir	<i>Abies magnifica</i> A. Murr.
White fir	<i>Abies concolor</i> (Gord. & Glend.) Lindl.
Grand fir	<i>Abies grandis</i> (Dougl.) Lindl.
Incense-cedar	<i>Libocedrus decurrens</i> Torr.
Port-Orford-cedar	<i>Chamaecyparis lawsoniana</i> (A. Murr.) Parl.
Sitka spruce	<i>Picea sitchensis</i> (Bong.) Carr.
Western hemlock	<i>Tsuga heterophylla</i> (Raf.) Sarg.
Mountain hemlock	<i>Tsuga mertensiana</i> (Bong.) Carr.
Western red-cedar	<i>Thuja plicata</i> Donn.
Lodgepole pine	<i>Pinus contorta</i> Dougl.

Hardwoods

California black oak	<i>Quercus kelloggii</i> Newb.
Tanoak	<i>Lithocarpus densiflorus</i> (Hook. & Arn.) Rehd.
Red alder	<i>Alnus rubra</i> Bong.
Pacific madrone	<i>Arbutus menziesii</i> Pursh
Bigleaf maple	<i>Acer macrophyllum</i> Pursh



